

ADDITIONAL NOTES ON THE GENUS TECTONA. I

Harold N. Moldenke

Explanation of the abbreviations employed for the names of herbaria in this and subsequent notes will be found in my booklet entitled "A list showing the location of the principal collections of Verbenaceae and Avicenniaceae", pp. 1--3 (1942) and its Supplement 1, pp. 1--2 (1947), and in *Phytologia* 3: 179--180 (1949), 3: 321 & 382 (1950), 3: 491 (1951), and 4: 295 (1953).

TECTONA L. f.

Literature: Rheede, Hort. Malab. 4: 57, pl. 27. 1683; Adans., Fam. Pl. 2: 445. 1763; L. f., Suppl. 20 & 151. 1781; Noronha, Verh. Batav. Gen. V, ed. 1, art. 4: 3. 1790; Roxb., Coromand. Pl. pl. 6. 1793; Spreng., Anleit. 2 (2): 893. 1818; Blume, Bijdr. 820. 1826; Reichenb., Conspect. Reg. Veg. 1: 117. 1828; Wall., Pl. As. Rar. pl. 294. 1832; Endl., Gen. Pl. 636. 1838; J. B. Müller, Bot.-Prosod. Wörterb. 1841; Hassk., 2e Cat. Lands Pl. Tuin. Buitenz. 135. 1844; Walp., Repert. 4: 98. 1846; Schau. in A. DC., Prodr. 11: 629. 1847; Miq., Fl. Ind. Bat. 2: 900. 1856; Bocq., Rev. Verbenac. 99, pl. 10. 1863; Bedd., Fl. Sylv. pl. 250. 1872; Brandis, For. Fl. N.W. & Cent. India 3: 354, pl. 44. 1874; Ulrich, Internat. Wörterb. Pflanzennamen. 1875; Benth. in Benth. & Hook., Gen. Pl. 2: 1152. 1876; Pritzell & Jessen, Deutsch. Volknamen Pfl. 1882; F. von Muell., Select. Extra-trop. Pl. Ind. Cult. 1885; Hook. f., Fl. Brit. Ind. 4: 570. 1885; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 167. 1895; Bull. Kolon. Mus. Haarlem. 1896; Koord. & Valet., Bijdr. Boomsart. Java 7: 164. 1900; King & Gamble, Journ. As. Soc. Beng. 74 (4): 808. 1908; Greshoff, Nieuw Plantk. Woordenb. Ned. Ind. 1909; E. D. Merr., Philip. Journ. Sci. Bot. 5: 227. 1910; Gerth van Wijk, Dict. Pl. Names 1319--1320. 1911; H. J. Lam, Verbenac. Malay. Arch. 4, 93--97, & 368. 1919; H. R. Blanford, Burma For. Bull. 24, Silvi., ser. 14. 1931; Nature 129 (3247): 134. 1932; A. W. Hill, Ann. Bot. 47 (188): 873--887. 1933; Grey & Hubbard, List Pl. Atkins Instit. 195 & 245. 1933; Junell, Symb. Bot. Upsal. 4: 87 & 89, fig. 135, & pl. 6, fig. 4. 1934; F. E. Eidmann, Tectona 27 (4): 233--287. 1934; A. W. Hill, Nature 133 (3372): 396--398. 1934; Moldenke, Phytologia 1: 154--163. 1935; Biol. Abstr. 9 (2): 413. 1935; H. W. Japing, Bergcultures 9: 8--21. 1935; M. V. Laurie, Indian Forester 64 (10): 596--600. 1938; N. Denoga, Philip. Journ. Forest. 2 (2): 173--183. 1939; Biol. Abstr. 13 (6): 1016 & 13 (10): 1768. 1939; F. C. Hoehne, Plant. Subst. Veg. Tox. 249--250. 1939; Moldenke, Prelim. Alph. List Invalid Names 9, 24, 28, 29, 33, & 43. 1940; Moldenke, Alph. List Invalid Names 7, 23, 27, 33, 43, & 44. 1942; Flor. Exch. 98 (25): 13. 1942; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 29, 38, 55, 59--67, 69, 74, & 100. 1942; Moldenke, Phytologia 2: 113-114. 1944; Exell, Cat. Vasc. Pl. S. Tomé 394. 1944; Darlington &

Janaki Ammal, Chromosome Atlas 271. 1945; Benthall, Trees of Calcutta 349--351. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 21. 1947; Falcão, Guia dos Visitantes Jard. Bot. Rio de Jan. 42. 1947; Acosta Solis, Proc. Inter-Amer. Conf. Conserv. Renewable Nat. Res. 329. 1948; Moldenke, Known Geogr. Distrib. Verbenac., ed. 2, 45, 49, 55, 93, 128--130, 137--140, 142--144, 146--148, 151, 163, & 196. 1949; Moldenke & Moldenke, Anal. Inst. Biol. 20: 12. 1949; Den Berger, Determinat. Houts. Mal. Fam. 73. 1949; Rawitscher, Cienc. Investig. 5: 145. 1949; Gundersen, Fam. Dicot. 200 & 202. 1950; Kirchheimer, Planta 39: 80. 1951; P. E. Case, Natl. Geogr. Mag. 102: 787 & 788. 1953.

Synonymy: Theka Adans., Fam. Pl. 2: 445, nom. rejic. 1763. Nautea Noronha, Verh. Batav. Gen. V, ed. 1, art. 4: 3, hyponym. 1790. Tectonia Spreng., Anleit. 2 (2): 893. 1818. Theka Rheede ex Reichenb., Conspect. Reg. Veg. 1: 117, in syn. 1828. Tectona L. apud Reichenb., Conspect. Reg. Veg. 1: 117. 1828. Tectonia L. f. apud Endl., Gen. Pl. 636. 1838. Theca Juss. ex Benth. in Benth. & Hook., Gen. Pl. 2 (2): 1152, in syn. 1876. Cajatana Thunb. ex Moldenke, Prelim. Alph. List Invalid Names 9, in syn. 1940. Tektona L. f. ex Moldenke, Prelim. Alph. List Invalid Names 43, in syn. 1940. Toktona Baker ex Moldenke, Alph. List Invalid Names Suppl. 1: 21, in syn. 1947. Tectoma Acosta Solis, Proc. Inter-Amer. Conf. Conserv. Renewable Nat. Res. 329, sphalm. 1948.

It is of interest to note that Noronha, in his Verhandelingen Bataaviaasch Genootschap, cited above, gives only the name Nautea as a new genus, without description, but cites the identifying Javanese name "jatti" and states that there are two species in the genus. Van Wijk, in the reference also cited above, gives the following as generic vernacular names: "Indian oak", "teak tree", "teak wood", "tectona", "Tekbaum", "tektone", "thek", "Theka-baum", "Tiek-baum", and "Tik-baum". The name, "African teak", according to Exell, in the reference cited to him above, applies to Chlorophora excelsa (Welw.) Benth. & Hook.

Reichenbach in the reference cited to him above places the genus Tectona in the Labiatae (=Lamiaceae), section Verbeneae. The spelling of the name as Tectonia L. f. occurs also in Walp., Repert. 4: 98 (1844).

Kirchheimer in the reference cited above, in speaking of fossil members of the genus Sacoglottis (Humiriaceae) says: "Verbenaceen - Die Steinkerne von Tectona besitzen weder eine axiale Innervation noch zeigen sie subapikale Leitbündelspuren. Den Früchten der Verbenaceen fehlen die im Endokarp mancher Sacoglottis-Arten vorhandenen Harzbehälter." The gynoecium-morphology of the genus is discussed by Junell in the reference cited to him above. Teak germination is discussed in the articles by Blanford, Denoga, Eidmann, and Hill cited above; seed growth under violet-colored glass in Flor. Exch. 98: 13 (1942); and branching and seed origin by Laurie in his reference cited above.

It is of interest to note that there is a forestry journal

called *TECTONA* published in Buitenzorg, Java, of which volumes 1 to 17 covered the years 1908 to 1924.

*TECTONA GRANDIS* L. f.

Literature: Rheede, Hort. Malab. 4: 57, pl. 27. 1683; Rumph., Herb. Amboin. 3: 34, pl. 18. 1743; L. f., Suppl. 151. 1781; Gaertn., Fruct. & Sem. Pl. 1: 275, pl. 57. 1788; Lour., Fl. Cochinchin., ed. 1, 137. 1790; Lam., Illustr. 2: 111. 1793; Roxb., Fl. Coromand. 1: pl. 6. 1795; Zoll. & Moritz, Syst. Verz. 53. 1845-1846; Schau. in A. DC., Prodr. 11: 629. 1847; H. Falconer, Rep. Teak For. Tenass. 1852; Miq., Fl. Ind. Bat. 2: 901. 1856; Spanoghe, Linnaea 15: 330. 1841; Hassk., 2e Cat. Lands Pl. Tuin. Buitenz. 135. 1844; Miq., Fl. Ind. Bat. Suppl. 1: 244. 1860; Brandis, Forest Fl. N.W. & Cent. India 3: pl. 44. 1874; J. Möller, Anat. Baumrind. 176. 1882; Hook. f., Fl. Brit. Ind. 4: 570. 1885; Forbes, Wander. Nat. Mal. Arch. 2: 226. 1885; Watt, Dict. Econom. Prod. Ind. 6 (4): 1--2. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 167, fig. 63. 1895; Koord. & Valet., Bijdr. Booms. Java 7: 165 & 171. 1900; Williams, Bull. Herb. Boiss., sér. 2, 5: 430. 1905; E. D. Merr., Bur. Gov. Lab. Bull. 27: 67. 1905; King & Gamble, Journ. As. Soc. Beng. 74 (4): 309. 1908; Costerus & Sm., Ann. Jard. Bot. Buitenz., sér. 2, 9: 113, fig. 17 & 18. 1911; Elbert, Meded. Rijks Herb. Leiden 12: 15. 1912; Koord., Exkurs. Fl. Java 3: 134. 1912; Koord. & Valet., Atlas Baumsart. 2: 6, pl. 255--272. 1914; Heyne, Nutt. Plant. Nederl. Ind. 4: 108. 1917; Basu, Ind. Medic. Pl. 3: 3, pl. 735. 1918; H. Hallier, Meded. Rijks Herb. Leiden 37: 34. 1918; H. J. Lam, Verbenac. Malay. Arch. 94--96 & 368. 1919; A. Chev., Explor. Bot. Afr. Occ. Franç. 1: 504. 1920; Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 28. 1921; E. D. Merr., Enum. Born. Pl. 512. 1921; E. D. Merr., Enum. Philip. Pl. 3: 389. 1923; Britton & P. Wils., Scient. Surv. Porto Rico 6: 152. 1925; Setchell, Univ. Calif. Publ. Bot. 12: 204. 1926; Heyne, Nutt. Plant. Nederl. Ind. 1312. 1927; R. O. Williams, Guide Royal Bot. Gard. Trinidad 26. 1927; Freeman & Williams, Useful Pl. Trinidad 157. 1928; Grey & Hubbard, List Pl. Atkins Instit. 195. 1933; Junell, Symb. Bot. Upsal. 4: 87--89, fig. 135, & pl. 6, fig. 4. 1934; Japing, Bergcultures 9: 8--21. 1935; Van Steenis, Bull. Jard. Bot. Buitenz. 13: 398. 1935; Moldenke, Phytologia 1: 154--163. 1935; J. Rombouts, Rodriguesia 2: 301. 1936; Spoon, Ber. Afd. Handelsm. Kon. Ver. Kolon. Inst. 107: 4. 1936; Van Steenis, Handel. Acht. Nederl.-Ind. Natuurwet. Cong. Soerabaja. 408--409. 1938; E. C. J. Mohr, Bodem der Tropen 2: 601. 1938; F. C. Hoehne, Plant. Subst. Tox. Medic. 250. 1939; Moldenke, Lilloa 4: 332. 1939; Moldenke, Prelim. Alph. List Invalid Names 28, 29, & 43. 1940; d'Araujo e Silva & de Almeida, Div. Defese Sanit. Veg. Dept. Nac. Prod. Veg. Minist. Agric. Rio de Jan. Publ. 16: 65--68. 1941; Biswas, Indian Forest Rec. Bot., new ser., 3: 42. 1941; Moldenke, Alph. List Invalid Names 27, 43, & 44. 1942; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 29, 38, 55, 59--67, 69, 74, & 100. 1942; Yunker, Bishop Mus. Bull. 178: 101. 1943; H. F. MacMillan, Trop. Plant. & Gard., ed. 5, 216, 217, 462, & 487. 1943; Menninger,

Descr. Cat. Flow. Trop. Trees 30. 1944; Moldenke, Phytologia 2: 113--114. 1944; Natl. Geogr. Mag. 87 (5): adv. sect. 1945; V. C. Dunlap in C. M. Wilson, New Crops for New World 281 & 282. 1945; Darlington & Janaki Ammal, Chromosome Atlas 271. 1945; Roy. Bot. Gard. Edinb. 18. 1946; Menninger, 1947 Cat. Flow. Trees 37. 1946; Razi, Journ. Mysore Univ. 7 (4): 63. 1946; Benthall, Trees of Calcutta 349--351. 1946; E. H. Walker, Contrib. U. S. Nat. Herb. 30 (1): 402. 1947; Acosta Solis, Proc. Inter-Amer. Conf. Conserv. Renewable Nat. Res. 329. 1948; Moldenke, Known Geogr. Distrib. Verbenac., ed. 2, 45, 49, 55, 93, 128--130, 137--140, 142--144, 146--148, 151, 163, & 196. 1949; Moldenke & Moldenke, Anal. Inst. Biol. 20: 12. 1949; Acosta Solis, Publ. Dept. Forest. Ecuador 7: 38. 1949; C. Rabenoro, Recherch. Quelq. Mysin. Madag. 64. 1949; Van Steenis, Act. Hort. Berg. 15 (2): 42. 1949; Menninger, Winter 1950 Seed List. 1950; Bevan, Biologia 2: 237. 1951; Ruggles, New York World-Telegram, Oct. 27, 1951, p. 9. 1951; J. Masters, New York Times Mag., May 25, 1952, p. 53. 1952; La Rue, Science, new ser., 115: 296. 1952; Razi, Poona Univ. Journ. 1 (2): 47. 1952; Santapau, Pl. Saurashtra 31. 1953; C. Peet, Am. Forests 60 (6): 20--21 & 40. 1954; Santapau, Indian Forester 80 (7): 387. 1954; Decaisne, Nouv. Ann. Mus. Nat. Paris 3: 402; Kuntze, Rev. Gen. Pl. 1: 508.

Illustrations: Rheede, Hort. Malab. 4: 57, pl. 27. 1683; Rumph., Herb. Amboin. 3: pl. 18. 1743; Gaertn., Fruct. & Sem. Pl. 1: pl. 57. 1788; Roxb., Pl. Coromand. 1: pl. 6. 1795; Lam., Tabl. Encycl. Méth. 1: pl. 136. 1797; H. Falconer, Rep. Teak Forests [pl. 1]. 1852; Bocq., Rev. Verbenac. pl. 10. 1863; Beddome, Fl. Sylv. pl. 250. 1872; Brandis, Illustr. For. Fl. N.W. & Cent. India 3: pl. 44. 1874; Blanco, Fl. Filip. pl. 114. 1877; Vidal, Sin. Fam. & Gen. Pl. Leff. Filip. Atlas pl. 74, fig. A. 1883; Nat. Tijdschr. Nederl. Ind. 51: pl. 1--7. 1892; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 168. 1895; Schimper, Pflanzen-Geogr. 376. 1898; Kronfeld, Atlas Pflanzengeogr. 162. 1899; Ahern, Philippine Woods 86. 1901; De Janville, Pl. Utiles Pays Chauds pl. 92. 1902; Agric. Prat. Pays Chauds 11 (2): 122. 1911; Ann. Jard. Bot. Buitenz. 24: pl. 21, fig. 17, & pl. 22, fig. 18. 1911; Costerus & Sm., Ann. Jard. Bot. Buitenz., sér. 2, 9: 113, fig. 17 & 18. 1911; L. Reinhardt, Kulturgesch. Nutzpfl. 4 (2): pl. 165. 1911; Talbot, For. Fl. Bombay 2: 347. 1911; Capus & Bois, Prod. Colon. 351. 1912; R. S. Pearson, Comm. Guide For. Econ. Prod. Ind. pl. 4. 1912; Koord. & Valet., Atlas Baumsart. Java 2: fig. 255--263 & 265--272. 1914; Kanehira, Firmosan Trees 404. 1917; Rock, Ornam. Trees Hawaii pl. 73. 1917; Basu, Ind. Med. Pl. 3: pl. 735. 1918; Bertin, Mission Forest. Colon. Franç. 3: pl. 24. 1919; Presid. Coll. Bot. Bull. Madras pl. 84. 1919; Van Gorkom, Oost-Ind. Cult., ed. 2, 3: 875 & 877. 1919; Unwin, W. Afr. Forests & Forestry 136, 150, 174, 184, 228, 234, & 486. 1920; Junell, Symb. Bot. Upsal. 4: fig. 135 & pl. 6, fig. 4. 1934; Dop in Lecomte, Fl. Gén. Indo-Chine 4: 799 & 811. 1935; A. P. Benthall, Trees of Calcutta 350. 1946; C. Peet, Am. Forests 60 (6): 20 & 21. 1954.

Synonymy: Tekka Rheede, Hort. Malab. 4: 57, pl. 27. 1683.



Jatus s. caju jati Rumph., Herb. Amboin. 3: 34, pl. 18. 1743. Tectona theka Lour., Fl. Cochinch., ed. 1, 137. 1790. Theka grandis (L. f.) Lam., Illustr. 2: 111. 1793. Theka grandis L. apud Fr. de Montholou, Notices sur l'Indie 60. 1837. Tectona grandis L. apud Bojer, Hort. Maurit. 258. 1837. Tectonia grandis L. f. apud Walp., Repert. 4: 98. 1846. Theka grandis Lam. apud Crévost & Pételot, Bull. Econom. Indo-chine 37: 1291--1292, in syn. 1934. Jatus Rumph. ex Moldenke, Phytologia 1: 163, in syn. 1935. Tectona grandis Roxb. ex Moldenke, Prelim. Alph. List Invalid Names 43, in syn. 1940. Tectona asiatica Hort. ex Moldenke, Prelim. Alph. List Invalid Names 43, in syn. 1940. Tectonia grandis L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 21, in syn. 1947. Tectonia grandis Willd. ex Moldenke, Alph. List Invalid Names Suppl. 1: 21, in syn. 1947. Toctona grandis L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 21, in syn. 1947. Toctona grandis L. f. ex Moldenke, Alph. List Invalid Names Suppl. 1: 21, in syn. 1947. Tectoma grandis Acosta Solis, Proc. Inter-Amer. Conf. Conserv. Renewable Nat. Res. 329. 1948.

Some authors state that this is the Quercus indica of Bontius (Java. 107) and the Quercus cajaten-hout of the Belgians. The binomial "Tectonia grandis L. f." is used also by J. Müller, Anatomie der Baumrinden, p. 176 (1882), and "Tectoma grandis" occurs again in Acosta Solis, Publ. Dept. Forest. Ecuador 7:38 (1949). Very detailed discussions of the history, culture, distribution, and uses of the species will be found in G. Watts' Dictionary of the Economic Products of India, cited above, and in Hugh Falconer's Report on the Teak Forests of Tenasserim Province...with other Papers on the Teak Forests of India -- a work of 315 pages, 2 plates, and 2 maps, published in 1852.

Because of the tremendous economic importance of this species and its wide distribution, it has an unusually large number of common names. Included among them are "adaritéku", "arbre à teck", "bois de teak", "bois de teck", "bois de tek", "bois puant", "cay-gô-gia-tri", "chêne de l'Inde", "chêne de Malabar", "chêne des Indes", "chêne du Malabar", "chingjagú", "common teak", "dalanang", "delandon", "dátí", "dölög", "dgaji", "djati", "djáti", "Djatibaum", "djatiboom", "djatihout", "djati lentak", "djatti-boom", "djattie-boom", "djatti-hout", "dodolan", "East Indian oak", "Eisenholzbaum", "fati", "grosser Tek-baum", "hadlayáti", "háti", "Indian oak", "indische eik", "indische Eiche", "indisches Teak", "indische Teak", "jádí", "jate-hout", "jati", "jatiboom", "Jatibaum", "jattiehout", "Java teak", "kajaten-hout", "kajoe jati", "kalayáti", "khaka", "kiaten-hout", "kiati-hout", "kyún", "kyuu", "kywon", "loherú", "pedda téku", "sag", "ság", "sagon", "sagun", "sagún", "ságún", "saguna", "sagun yáti", "sag ván", "sagván", "ság wán", "sagwán", "sagwani", "saigun", "saigún", "sáj", "sak", "sáka", "saku", "sákhú", "sal", "sál", "segun", "según", "ship tree", "sígwan", "singuru", "sipna", "teak", "Teakbaum", "teakboom", "Teakholz", "teakhout", "teak tree", "teak tree of India", "teak wood", "teak-wood",

"teakwood", "teca", "téca", "teca da India", "teck", "teck des Indes", "téga", "tegina", "tegina-mara", "tégu", "tek", "ték", "teka", "Tek-baum", "Tekholz", "tekhout", "tekka", "tékka-maram", "tékku", "tékkumaram", "téku", "téku-mánu", "theca", "theck", "Theka Baum", "Thekholz", "Tiekhholz", "Tihk Baum", "Tikbaum", "Tikhholz", "tyágada mara", "yáti", and "Zimmer Baum".

Collectors have noted it in flower in February, May, and August, and in fruit in December. Quisumbing reports a 3-year-old tree may be 7 meters tall. Hoehne reports that it is used in the treatment of cholera, syphilis, and bacterial infections. Cheesman reports that it is planted on a commercial scale on Trinidad. Several authors report that the trees are usually killed by girdling about 3 years before they are felled. Yuncker states that a few trees of this species have been introduced on Niue Island from Samoa and are to be found on the government plantation at Fonukula, where they appear to be doing well. Menninger reports that in regions where there is a pronounced dry season the tree is deciduous and will flower and fruit after the new leaves have come on with the ensuing wet season. Chevalier records it as cultivated at Lagos, Nigeria. It is reported by Razi from Mysore, India, and is called a megaphanerophyte by him in accordance with Raunkiaer's classification of life-forms. Richard states that it is a large tree in gardens on Réunion. It has been collected at altitudes of 10--30 meters on Kangean, 100 meters on Java, and 100--150 meters on Madura Island.

Acosta Solis describes it as "a species of mahogany, which grows rapidly and produces a good grade of wood" and is "adecuada para las áreas tropicales de la costa" in Ecuador. MacMillan describes it as a gregarious tree, yielding one of the most important commercial timbers of the tropics. The best wood is considered to be yielded by trees growing in calcareous soils. It is, he says, one of the timbers that are reasonably immune to termite attack. Twenty-four of the seeds weigh an ounce, 384 a pound, and there are usually 2 or 3 seeds per fruit. The foliage is attacked by the Teak Leaf-eater (*Hybloea puera*), whose attacks may be controlled by a lead-arsenate spray. Dunlap, on the other hand, says it is a fast-growing tree "free of pests and diseases. Excellent, probably the best, hard timber, resistant to weathering, salt water, fire, and termites. Young trees suffer somewhat from high winds in exposed places because of the large surface area of the leaves, but partial leaf pruning for the first two years corrects this. Requires deep subsoil and only moderate rainfall. At age of one year, nursery seedlings are cut off an inch above the ground and the root 12 inches under; these stumps are then planted in field. Growth is rapid when young -- 8 feet in six months, 26 feet in seventeen months with diameter of 3 inches."

Bojer records the species as cultivated in the Royal Botanic Garden at Pampelmousse, Mauritius, and says it is native to eastern India, Pegu (Burma), and the Moluccas. Lam records the species (not in cultivation) from India, Malacca, Burma, Sumatra, Java, Borneo, the Philippines, Marianna Islands, Sumbawa, Bali,

Kangean, and Celebes. Van Steenis is of the opinion that it is now native only to Lower Burma and central Java, and that this disjunct distribution, shared by various other species, is due to change in geography and climate following the last Ice Age. Altona, on the other hand, believes that the Hindus originally imported the species into Java when they migrated there.

The Koorders 10480b cited below shows seedling leaves irregularly serrate throughout. The Mendoza 62, also cited below, has a label which indicates that the species is both planted and naturalized on the island of Luzon. The Kelly 144 collection is a mixture with something fabaceous. The Bois 539 is from the herbarium of Prince Roland Napoleon Bonaparte, and the Jack 8174 collection includes seed. A sheet of this species is on exhibit in case 409 of the Oakes Ames Economic Herbarium at Cambridge, Massachusetts. Walker cites a Surridge 1938b from Fiji, not yet seen by me. L. H. Bailey's 1935 catalogue of dealers and seedsmen handling Verbenaceae lists Taihoku as a source of this species. La Rue in the reference cited above reports on the presence of root grafts in teak. Thorenaar reports that on his collection the leaves are "gespikkeld, grootendeels wit", so it may actually represent var. glabrifolia rather than the typical form. The fig. 264 of Koorders and Valetton's Atlas Baumsarten, vol. 2 (1914), often cited for this species, actually represents f. abludens.

Additional citations: PANAMA: Canal Zone: C. D. Mell 8 (N, N). CUBA: Oriente: Clément 6121 (N). PUERTO RICO: Cobin 17664 (Kr). MARTINIQUE: Bélanger 182 (X, X); Plée s.n. (B). FRENCH GUIANA: Poiteau s.n. [Cayenne] (P, P, P). BRAZIL: Rio de Janeiro: Karwinski s.n. (Br, Br, Br); Vauthier s.n. [1836] (P). State undetermined: Regnell s.n. (Us); Widgren s.n. (Us). MADAGASCAR: Bojer s.n. (P). INDIA: Bombay: Herb. Coll. Pharmacy s.n. (Pa); Kuntze 7448 (It). Madras: Gamble 15245 (Bz--23673); G. Thomson s.n. [Maison & Carnatic] (S); Wight 2306 (Bz--23683). United Provinces: Collector undesignated s.n. [Mangalor] (N); Hohenacker 169 (S); Pait s.n. [August 1928] (Mi), s.n. [December 1928] (Mi); Razdan s.n. [3.9. & 11.9.28] (S). State undetermined: Herb. T. Cooke s.n. (Mi); Herb. Roxburgh s.n. [Herb. Martii] (Br, Br, Br, Br); Herb. Swartz s.n. [ex India orientali] (S); Willard s.n. (Oa). BURMA: Tenasserim: Brandis s.n. [Attaran] (Bz--23682); Chauteen 24 (Br); Falconer 752 (Bz--23681); Herb. Imp. Forest. Inst. 11500 [Herb. Burma Forest. School 27] (Br); Meebold 7603 (S). CEYLON: König s.n. [1784] (S). INDOCHINA: Cochinchina: Herb. Jard. Bot. Saigon s.n. (S); Pierre VII (Bz--23687), s.n. (N). STRAITS SETTLEMENTS: Malacca: W. Griffith s.n. [Malacca, 1845] (Br). PHILIPPINE ISLANDS: Basilan: D. P. Miranda s.n. [Herb. Philip. Bur. Sci. 18947] (Cm, Cm, Gg--31264). Luzon: Mendoza 62 (N); M. Ramos 3294 (Bz--23644, Bz--23645, Bz--23646), s.n. [Herb. Philip. Bur. Sci. 3294] (Bz--23643); C. B. Robinson 11885 (Bz--23642); Robinson & Ramos s.n. [Herb. Philip. Bur. Sci. 11885]

(Bz--23641, Lu, S, S). Mindanao: Ahern 602 (Bz--23649, Bz--23650), 835 (Bz--23651, Bz--23652); Whitford & Hutchinson s.n. [Herb. Philip. Bur. Sci. 9460] (Cm). MARIANNA ISLANDS: Guam: Glassman 246 (Ur, Ur, Ur); J. B. Thompson 253 (Bz--23685, Bz--23686). SUMATRA: Herb. Bogoriense 23668 (Bz), 23669 (Bz), 23670 (Bz); Lürzing 4070 (Bz--23671); Ostwald 14 [Boschproefstation BB.6241] (Bz--23666, Bz--23667); Van Steenis 3174 (Bz--23665); Völke 1 [Boschbouwproefst. BB.25519] (Bz--23660), 2 [Boschbouwproefst. BB.25520] (Bz--23661, Bz--23662), 3 [Boschbouwproefst. BB.25521] (Bz--23663), 4 [Boschbouwproefst. BB.25522] (Bz--23664). MADURA ISLAND: Backer 19909 (Bz--23630). JAVA: Bakhuizen van den Brink Jr. 1919 (Ut--24922); Beumée s.n. [IX.1919] (Bz--23515); Franck 88 (S); Koorders 9750b (Bz--23536), 9751b (Bz--23537, Bz--23538), 9752b (Bz--23600), 9753b [Boschwezen 1022a] (Bz--23601, Bz--23602), 9754b (Bz--23604), 9755b (Bz--23605), 9757b (Bz--23552), 9758b (Bz--23553, Bz--23554), 9759b (Bz--23534, Bz--23535), 9760b (Bz--23557, Bz--23558, Bz--23559), 9761b (Bz--23589), 9762b [Boschwezen 1036i] (Bz--23584, Bz--23585), 9763b [Boschwezen 1037i] (Bz--23587, Bz--23588), 9764b (Bz--23573), 9765b (Bz--23590, Bz--23591, N), 9766b (Bz--23613, Bz--23614), 9768b (Bz--23606), 9769b (Bz--23545, Bz--23546), 9770b (Bz--23548, Bz--23549, Bz--25701), 9771b (Bz--23619, Bz--23620, Bz--25700), 10480b (Bz--23580, Bz--23581), 12794b (Bz--23607), 13737b (Bz--23564, Bz--23565), 13740b (Bz--23560, Bz--23561), 20137b (Bz--23568, Bz--23569), 20632b (Bz--23621, Bz--23622, Bz--23623), 20640b (Bz--23612), 20641b (Bz--23617, Bz--23618, Ut--59744), 20642b (Bz--23626, Bz--23627), 20643b (Bz--23628, Bz--23629), 20644b (Bz--23624, Bz--23625, Ut--59736), 23993b (Bz--23594, Bz--23595, Bz--23596), 24547b [Boschwezen 57c] (Bz--23562, Bz--23563), 24598b (Bz--23570, Bz--23571), 25287b [Boschwezen 57a] (Bz--23592, Bz--23593, N), 28472b [Boschwezen 1037i] (Bz--23576, Bz--23577), 28476b [Boschwezen 1036i] (Bz--23582, Bz--23583), 29621b (Bz--23603), 29622b (Bz--23539, Bz--23540, Bz--23541, Ut--59737, Ut--59738, Ut--59739), 29623b [Boschwezen 1023a] (Bz--23551, Ut--59741, Ut--59742), 29886b [2401] (Bz--23542, Bz--23543, Bz--23544), 29917b (Bz--23610, Bz--23611, Bz--25638), 30098b (Bz--23615, Bz--23616), 30192b (Bz--23608, Bz--23609), 30193b [2609] (Bz--23547), 30298b (Bz--23572), 33239b [Boschwezen 1037i] (Bz--23578, Bz--23579), 33248b (Bz--23586), 36529b (Bz--23597, Bz--23598), 42274b [boom 126t] (Bz--23550), s.n. [22.II.88] (Bz--25639), s.n. [19.III.88] (Bz--25640); Leeuwen-Reijnvaan s.n. (Bz--23523); Ploem s.n. [Java] (Bz--23516); Slouten 628 (Bz--23521); Thorenaar s.n. [III.1927] (Bz--23522); Thunberg s.n. [1777] (S); Van Steenis 1503 (Bz--23520); Voogd s.n. [28-6-1941] (Bz--23518); Warburg 4079 (Oa); Wind Hzn 6202 (Bz--23514); Zollinger 1330 (S). BORNEO: Labohm 1185 (Bz--23503).



CELEBES: Bünnemeyer 10702 (Bz--23653, Bz--23654, Bz--23655); Rachmat 316 (Bz--23656, Bz--23657, Bz--23658); Waturandang 198 [Boschbouwproefst. BB.21719] (Bz--23659). KANGEAN ARCHIPELAGO: Kangean: Backer 26840 (Bz--23634, Bz--23635, Bz--23636, Bz--23637). Paliat: Backer 29587 (Bz--23632, Bz--23633). Sepandjang: Backer 28762 (Bz--23631). LESSER SUNDA ISLANDS: Depok: Herb. Acad. Rheno-Trai. s.n. (Ut--88913a, Ut--88914a, Ut--88915a, Ut--88916a, Ut--88917a, Ut--88918a). MOLUCCA ISLANDS: Amboina: De Bell 27 [Boschproefst. BB.10121] (Bz--23638, Bz--23639); C. B. Robinson 298 (Bz--23640). CULTIVATED: Florida: Buswell s.n. [Dec. 11, 1944] (Bu); Fennell 1036 [Coconut Grove Garden no. 3512] (Oa--13644). Cuba: Acuffa 16111 (Es); A. J. Eames s.n. [March 10, 1948] (It); Jack 8174 (N); Moldenke & Moldenke 19886 (Es, Lg, Mg, N, No, Ot, Sm). Guadeloupe: C. S. Parker s.n. (K). Martinique: Hahn 1275 (Bm, Br, Br, P, P, Us); Plée 720 (P, P, P, P). Trinidad: W. E. Broadway s.n. [Sept. 4, 1916] (K); Buijsman s.n. [22 Aug. 1893] (Na--17407, Na--17408); Wrbna s.n. [Sieber Fl. Trinit. 27] (Dc, Le, Le, Lu, Mu--730, V, V). French Guiana: Poiteau s.n. (P). Brazil: Guillemain 668 (P); Herb. Harvey s.n. [cultivé Jard. Bot. de Rio-Janeiro, 1839] (Du--166525); Weddell 425 (Cb, Cb, Cb); Whitford 2 (K). Denmark: Herb. Liebmann s.n. (Le). Netherlands: Herb. Lugd.-Bat. 902530 (Le, Le, Le); Herb. Persoon s.n. (Le); Pulle s.n. [V.1906] (Ut, Ut). Belgium: Herb. Decaisne s.n. (Br, Br); Herb. Martius s.n. (Br, Br); Lejeune s.n. (Br, Br). Egypt: Kotschy s.n. [1855] (V, V, V); Prince Paul of Wurttemberg s.n. (V); Schweinfurth 2361 (Bm). Ruada Island: Prince Paul of Wurttemberg s.n. (Mu--1602). Cameroons: Winkler 56a (B, B), 104 (B, B). Belgian Congo: Corbisier Balanot 1098 (Br). Mascarene Islands: Mauritius: Commerson s.n. (P, P, P, P, P, P). Réunion: L. C. Richard s.n. (P, P, P, P, P). India: T. Anderson 28 (P); Bell 679 (K); Herb. Hort. Bot. Calcuttensis 772/4 (B, B, B, Dc, K), 772/5 (K), s.n. [cult. in Hort. Bot. Cal.] (Le), s.n. (Ed, Mu--735, Mu--1470); Hooker f. & Thomson s.n. (Le); Jamieson s.n. [Sahārapore] (Ed); Kirat Ram 28404 (S, S); Kurz s.n. [cult. in Horto Botanico Calcuttensi] (Bz--23672, Bz--23679, Bz--23680, N); R. R. Stewart 1107 (K); T. Thomson s.n. [Plan. Ganget. Sup.] (B, V), s.n. (P); Wallich 772 (X), 772d (P). French India: Pondicherry: Leprieur s.n. [Pondicherry] (P); Perrottet 71 (P). Ceylon: C. F. Baker 126 (Bl--42355, Cp, Cp, Du--108689, Ed, It, K, K, Le, Ms, P, Po--252461, Po--253449, Se--61473, Ut); W. E. Broadway s.n. [Sept. 4, 1916] (Du--119764). Formosa: W. R. Price s.n. [Kagi, 11.2.12] (K, K). Hongkong: Urquhart 36 (K, K). Cochinchina: Pierre s.n. [Saigon, 8/1877] (P), s.n. [Hort. Bot. Saigonensis] (Bm); Thorel 1279 (P), s.n. [1862-1865] (S). Tonkin: Bois 539 (Oa); Fleury s.n. [Chevalier 37753] (P). Straits Settlements: Furtado s.n. [Bot. Gard. Singapore, 12 Sept. 1929] (Bm); Maingay 1193 (K). Philippine Islands: Gates & Quisumbing 7989 (Ka--66740).